Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Carlsbad**

Print Date: **3/9/2000**

Site Summary Level: **Waste Isolation Pilot Plant**

HQ ID: **0008**

Project **CAO-1 / WIPP Base Operations**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

The base operations project includes all activities required to maintain waste receipt and disposal operations including mining, waste handling and Facility Operations. Also included in this project are activities required to maintain and operate WIPP that are not directly related to waste disposal, such as maintaining compliance with federal and state laws, regulations and standards not related to radioactive or hazardous waste; providing a safety and health program that includes radiation safety, industrial safety and emergency management; quality assurance; performing maintenance on 21 systems and associated subsystems and equipment; operating and monitoring facility systems on a 24 hour per day, 7 days a week; and maintaining the underground facilities. Currently the underground facilities consist of 2,400,000 square feet of horizontal openings and 4 vertical shafts, each over 2,150 feet deep. In addition, this project includes the administrative services and program management activities required to achieve day-to-day and long term objectives of the site.

The baselined funding profile in this PBS will provide for the emplacement of TRU waste from most TRU waste sites by the end of FY 2006 and for WIPP to reach its planned TRU waste capacity by FY 2034.

Technical Approach: The WIPP facility resides inside a 16 square mile area placed under the jurisdiction of the DOE by the Waste Isolation Pilot Plant Land Withdrawal Act of 1992 (LWA) as amended. The WIPP facility is designed to accomplish three goals: 1) receive, handle, and dispose of TRU and TRU-mixed waste; 2) protect the health and safety of workers, the public and the environment; and 3) comply with applicable radiation protection standards, environmental regulations, and requirements of federal, state, and local agencies. The amount of waste to be received at WIPP is governed by the LWA as amended which set the total volume for Contact Handled (CH) and Remote Handled (RH) waste at a maximum of 175,600 cubic meters (6.2 million cubic feet), and an activity level associated with RH waste limited to 5.1 million curies. The surface facilities at the WIPP accommodate the personnel, equipment, and support services required for the receipt, preparation and transfer of the waste from the surface to the underground. Four vertical shafts connect the surface facilities to the underground. The underground waste disposal area is located in a geologic repository 2,150 feet below the surface in a rock salt formation. The waste disposal area will consists of 8 panels, each having seven rooms. A 35 year operating period is estimated to mine and fill all 8 panels and the 4 access drifts. The 35 year period will begin the day the first drum of waste is emplaced. At the end of the 35 year operational period, it is estimated that 5 years will be required for closure of the repository to complete dismantlement and decommissioning activities. After closure, active institutional controls for the prevention of human intrusion will be employed for a period of 100 years. The National Research Council`s report on the WIPP, dated October 1996, validated the project as a viable solution for the permanent, safe disposal of defense generated radioactive TRU waste.

Project Status in FY 2006:

The WIPP will have received 38579 cubic meters of waste. This equates to approximately 5,326 shipments to the WIPP through FY 2006. Through FY2006, 23% of the WIPP`s CH-TRU and 7% of the RH TRU waste handling capacity is used. The following CH/RH volumes will be received: ANL-E, 95/0; Hanford, 4038/3; INEEL, 10141/0; LANL, 5220/209; LLNL, 251/0; Mound, 494/0; NTS, 616/0; ORNL, 536/279; RFETS, 14817/0; SRS, 1441/0; SQS, 250/17; D&D, 172/0, for a total of 38,071 cubic meters of CH and 508 cubic meters of RH.

Project Baseline Summary Report

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Project **CAO-1 / WIPP Base Operations**

Project Description Narratives

Post-2006 Project Scope:

Continued disposal of the remaining TRU waste inventory until the WIPP waste volume capacity reaches the statutory limits in FY 2034, after which five years are planned to seal the repository and dismantle and decommission the surface facilities. Active institutional controls will then be activated and maintained for 100 years. It is expected CAO will receive 136,953 cubic meters of TRU waste after FY 2006 from TRU waste sites. The following CH/RH volumes will be received: ANL-E, 56/0; Hanford, 12033/2805; INEEL, 27828/228; LANL, 8804/230; LLNL, 720/0; Mound, 0/0; NTS, 54/0; ORNL, 466/291; RFETS, 0/0; SRS, 18430/0; SQS, 235/3; D&D, 61764/3006, for a total of 130,390 cubic meters of CH and 6563 cubic meters of RH.

Project End State

TRU waste management activities for both CH and RH waste are projected to be completed by FY 2039 after completing the Disposal Phase in FY 2034 and five years for decommissioning of the surface facilities and permanently closing the underground. In accordance with the WIPP Land Withdrawal Amendment Act of 1996, DOE will have disposed of 175,600 cubic meters of TRU waste in the WIPP facility. Starting in FY 2039, a reduced Federal staff and technical contractor support will maintain the active institutional controls associates with the land and records of the WIPP. Monuments and markers will be built at the site to warn people of the presence of the repository. Active institutional controls over the site will be maintained for 100 years. Low risk has been assigned based upon performance assessments included in the licensing of the facility, which requires no migration of hazardous or radioactive material for 10,000 years. Following completion of the project, there will be no access to the underground. The surface area will be unrestricted for recreational and agricultural uses.

Cost Baseline Comments:

The CAO has institutionalized a formal program planning and budget execution process. The confidence level of cost estimates for the next three years is very high (+/- 5%). Out year estimates through FY 2006 have been developed with a confidence level of +/- 10 to 20%. Estimates from FY 2007 through completion are within +/- 30%. There are no contingency funds included in the CAO estimates.

Current CAO assumptions support operations of the WIPP facility, including its infrastructure, as an operational nuclear facility capable of receiving TRU waste at an initial disposal rate of 5 shipments per week and ramping to 17 shipments per week. The statutory requirement to pay impact assistance to the State of New Mexico is funded. The CAO baseline provides adequate funding to meet the National TRU Waste Management Program. Escalation has been applied to the activities in accordance with the DOE Environmental Management guidelines.

Safety & Health Hazards:

The S&H hazards at the WIPP site include fire, industrial, radiological, and occupational. The WIPP Fire Protection Program supports DOE Order 440.1, Fire Protection, and includes maintaining an inspection, testing and maintenance program of the site fire systems, loss prevention, and review or modification of the new facilities or systems. The water supply system meets the minimum 2 hour stored water capacity for fire water. The Industrial Safety Program applies guidelines of the OSHA Safety and Health Guidelines and implementing OSHA and MSHA regulations. The WIPP Site has implemented an Integrated Safety Management System (ISMS) to protect employees and manage environment, safety, and health obligations in a safe and effective manner. The ISMS establishes the necessary organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, and maintaining the WID Integrated Safety Management Policy, MP 1.28. The ISMS description was developed to present WID elements that make up the ISMS and to illustrate how these elements conform to the

Project Baseline Summary Report

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Project **CAO-1 / WIPP Base Operations**

Project Description Narratives

DOE`s expectations of contractors as set forth in DOE P 450.4, Safety Management System Policy, the DOE Plan for the Development and Implementation of Integrated Safety Management (Implementationl Plan for Board Recommendation 95-2), and DOE Acquisition Regulation Clauses 970.5204-2 and 970-5204-78. The WIPP site was the first DOE site to be awarded Star status under the DOE Voluntary Protection Program. The DOE-VPP Star means that the contractor was recognized for outstanding achievements in incorporating safety and health programs into the management system. Several DOE programs at other sites have been revised to reflect the rigorous and detailed attention to workplace safety at the WIPP. Revised manuals include the Model Electrical Safety Program, the Hoisting and Rigging Manual and the Pressure Safety Manual. The Industrial Hygiene program exists to anticipate, recognize, evaluate, and control industrial hygiene hazards in the workplace in compliance with the DOE Order 440.1. The program uses complete computerized system for the tracking of chemical use, quantity, and location. Types of chemicals that can be found at the WIPP include, but is not limited to diesel fuel. The Industrial Hygiene Status Report and Assessment Strategy continues to be an effective mechanism for determining sampling strategies during routine activities. Ergonomic concerns, especially in office areas and workplace design, represents an exposure that is being addressed through engineering, training, and implementation of the ergonomic plan. Radiological Engineering provides a safe working environment for WID employees, employees of other companies and government agencies, and the public visiting or working at the WIPP. This is accomplished by controlling exposure to ionizing radiation and radiological contamination; applying the principles of As Low As Reasonably Achievable to all aspects of operations, and maintaining appropriate records of activities. Radiological Engineering provides support to Operational Health Physics (OHP) with regard to regulatory compliance, procedure development, HP technician certification, and instrument research and development. Operational Health Physics program includes the implementation of the Defense-in-Depth radiation monitoring and contamination control programs at the WIPP. These activities are conducted in accordance with 10 CFR 835 and the DOE radiological control manual. OHP programs include calibration and operation of fixed and portable instruments; conducting routine and non-routine radiological surveys; operation of the airborne radioactivity detection systems; and maintenance of the HP Technical Certification Program. OHP support of Operations includes administration of Radiological work permits; surveys of TRUPACTS and waste packages; setup, posting, and control of radiological boundaries; personnel surveys; on-site radiological emergency response services; and waste handling procedure validation. Dosimetry and occupational dose recording and reporting are required by the DOE Radiological control Manual, DOE Orders and Code of Federal Regulation. The dosimetry program is also required to maintain accreditation by the DOE Laboratory Accreditation Program. The Occupational Health Program provides medical services in compliance with DOE Orders and Code of Federal Regulation, and other regulatory drivers. Activities include employee wellness initiatives and counseling, employee health examinations, which are performed prior to placement and qualification, periodic return to work, fitness for duty, and termination. All of the examinations are maintained in accordance with the Americas with Disabilities Act applicable regulations and under applicable circumstances. Diagnosis and treatment of occupational illnesses is performed and maintained under the direction of the Occupational Medical Director. Medical equipment is upgraded as necessary to maintain appropriate levels of service.

Safety & Health Work Performance:

The WIPP Site began waste disposal operations in March 1999. Prior to startup, the WIPP underwent several reviews which demonstrated the facility was safe to begin operations for TRU waste disposal. DOE Order 425.1 was the driver for these reviews. The activities included a Management Assessment, an Integrated Facility Checkout, a Westinghouse Corporate Operational Readiness Review (ORR), and a DOE Operational Readiness Review. The Management Assessment was the first step in the process which determined the readiness of the WIPP to receive and emplace CH transuranic (TRU) and TRU mixed waste for permanent, deep-geologic disposal. The scope included an assessment of minimum core requirements applied to key functional areas, systems and organizations necessary to start waste disposal operations. The Integrated Facility Checkout (IFC) began on April 1, 1997. The purpose of the IFC was to place WIPP in an "operational mode", performing all activities associated with waste receipt and emplacement. During the first phase of the IFC, simulated operations of TRU waste receipt were conducted. These operational activities included

Project Baseline Summary Report

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Site Summary Level: **Waste Isolation Pilot Plant** HQ ID: **0008**

Project **CAO-1 / WIPP Base Operations**

Project Description Narratives

preventive and corrective maintenance items in radiological areas, unloading of TRUPACT-II's, and simulated waste emplacement in the underground. The readiness reviews by Westinghouse and DOE were a part of the ORR process which objectively determined and documented the ability of WIPP to safety handle and emplace contract handled waste for permanent disposal in the underground repository. This readiness process implemented the requirements of DOE Order 425.1. Successful completion of the CH Waste Disposal ORR process was one of the primary factors involved in the Secretary of Energy's final decision to operate WIPP as a disposal facility. The average cost per Engineer (burdened rate) is $90K/year and per technician is $54K/year

PBS Comments:

The CAO has recommended a Management Plan configuration for implementation that will guide the ten-year planning process consistent with the strategic objectives, as well as achieve the overall TRU waste management goals. The facilities and activities described in the National TRU Waste Management Plan, Revision 1, combined with the disposal-ready waste preparation schedules, summarize current guidance to support development of site 2006 Plan.

Baseline Validation Narrative:

The National Research Council's report on the WIPP dated October, 1996, validated the project as a viable solution for the permanent, safe disposal of defense generated radioactive TRU waste. Mevatec Corporation contracted in FY 1998 to perform an independent baseline validation of the scope, schedule, and cost of the National TRU Waste Program managed by the Carlsbad Area Office (CAO). This validation and the final report was issued in April, 1999. The validation findings are consistent with this IPABS update. Information sources used in the CAO independent budget validation include, but are not limited to: Integrated Priority List Details for the FY 2000 Budget (CAO, March 1998); FY 2000/2001 Validation Submittals from CAO and TRU Waste Sites, CAO Technical Assistance Contractors (CTAC), Sandia National Labs (Vols. 1-2), and Westinghouse, WID (Vols. 1-6); Minutes of all FY 1999/2000 Validation and FY 2000-2006 Program Review Meetings; FY 2000 Validation and FY 2001-2006 Program Planning; IPABS Handbook, Rev 8; International Research and Development Plan, 1 October 1997, Rev. 0; CAO FY 2000/2001 Validation and FY 2002 through FY 2006 Planning Addendum; "Budget Planning, Programming & Execution Process Description - Draft"; and The National TRU Waste Management Plan, DOE/NTP-9691204, Rev. 1.

General PBS Information

Project Validated? Yes **Date Validated:** 9/23/1996

Has Headquarters reviewed and approved project? No

Date Project was Added: 12/1/1997

Baseline Submission Date: 7/7/1999

FEDPLAN Project? No

Drivers:

CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
N	Y	Y	Y	N	Y	Y	Y

Project Baseline Summary Report

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Operations/Field Office: **Carlsbad** Print Date: **3/9/2000**

Site Summary Level: **Waste Isolation Pilot Plant** HQ ID: **0008**

Project **CAO-1 / WIPP Base Operations**

General PBS Information

Project Identification Information

DOE Project Manager: Ines Triay

DOE Project Manager Phone Number: 505-234-7300

DOE Project Manager Fax Number: 505-234-7027

DOE Project Manager e-mail address: triayi@wipp.carlsbad.nm.us

Is this a High Visibility Project (Y/N): Y

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	1,212,463	6,426,101	7,638,564	100,058	100,058	98,979	98,979	104,893	120,066	126,400	127,534	130,238	133,059	133,779	137,457
PBS Baseline (constant 1999 dollars)	1,134,442	3,791,690	4,926,132	100,058	100,058	98,979	98,979	104,893	116,909	120,545	119,125	119,149	119,226	117,406	118,152
PBS EM Baseline (current year dollars)	1,212,463	6,426,101	7,638,564	100,058	100,058	98,979	98,979	104,893	120,066	126,400	127,534	130,238	133,059	133,779	137,457
PBS EM Baseline (constant 1999 dollars)	1,134,442	3,791,690	4,926,132	100,058	100,058	98,979	98,979	104,893	116,909	120,545	119,125	119,149	119,226	117,406	118,152

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	143,970	146,760	150,014	153,460	754,571	826,300	925,703	1,037,067	1,169,029	1,119,227	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	121,205	121,013	121,152	121,386	561,026	553,723	559,110	564,551	573,579	494,945	0	0	0	0	0	0

Project Baseline Summary Report

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Operations/Field Office: **Carlsbad** Print Date: **3/9/2000**

Site Summary Level: **Waste Isolation Pilot Plant** HQ ID: **0008**

Project **CAO-1 / WIPP Base Operations**

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS EM Baseline (current year dollars)	143,970	146,760	150,014	153,460	754,571	826,300	925,703	1,037,067	1,169,029	1,119,227	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	121,205	121,013	121,152	121,386	561,026	553,723	559,110	564,551	573,579	494,945	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	2.70%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%	2.10%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/1/2039

Current Projected End Date of Project: 3/26/2039

Explanation of Project Completion Date Difference (if applicable):

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars): 4,644,462 **Actual 1997 Cost:** 100,058 **Actual 1998 Cost:** 98,979

Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars): 4,445,425 **Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):** 120,026

Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars): 4,565,451

Project Cost Changes

Project Baseline Summary Report

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Operations/Field Office: **Carlsbad** Print Date: **3/9/2000**

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Project **CAO-1 / WIPP Base Operations**

Project Reconciliation

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):		
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):	5,233	Requirement for addtl RH Bore Hole Plugs (FY02-FY35)not identified previously.
Cost Growth Associated with Scope Previously Reported (+):	153,655	1 year delay of waste receipt; Correction of WID unescalated labor rates unchanged since FY97.
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	4,724,339	
Additional Amount to Reconcile (+):	2,756	IDMS de-escalation calculation assumes that each five year period is based on a linear plan.
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**4,727,095**	

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Begin RH Disposal Operations	CAO-001-003		1/21/2002								Y
Complete Waste Emplacement in Panel 2	CAO-001-005		9/30/2004								Y
Complete Waste Emplacement in Panel 3	CAO-001-006		1/22/2007								Y
Complete Waste Emplacement in Panel 4	CAO-001-007		12/29/2008								Y
Complete Waste Emplacement in Panel 5	CAO-001-008		12/6/2010								Y
Project Mission Complete	CAO-001-009		3/26/2039								
Begin CH Disposal Operations (predicated on hearing date of 3/5/99).			3/31/1999						Y		Y
Complete Waste Emplacement in Panel 1			5/31/2002								Y
Begin Paths to Closure and Life Cycle Costs			10/1/1996								

Milestones - Part II

Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Carlsbad**

Print Date: **3/9/2000**

Site Summary Level: **Waste Isolation Pilot Plant**

HQ ID: **0008**

Project **CAO-1 / WIPP Base Operations**

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Begin RH Disposal Operations	CAO-001-003										
Complete Waste Emplacement in Panel 2	CAO-001-005										
Complete Waste Emplacement in Panel 3	CAO-001-006										
Complete Waste Emplacement in Panel 4	CAO-001-007										
Complete Waste Emplacement in Panel 5	CAO-001-008										
Project Mission Complete	CAO-001-009				Y						
Begin CH Disposal Operations (predicated on hearing date of 3/5/99).											
Complete Waste Emplacement in Panel 1											
Begin Paths to Closure and Life Cycle Costs				Y							Beginning of Paths to Closure and Life Cycle Costs

Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planne 200
TRU														
Disp. At WIPP	M3	38,177.19	138,291.63	176,468.82	0.00		0.00		216.98	2,505.09	4,744.24	5,696.79	5,861.42	6,900.6

Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035
TRU													
Disp. At WIPP	M3	6,900.60	6,149.33	6,102.74	5,965.04	6,305.25	6,114.03	6,320.57	29,614.69	22,825.86	21,806.27	19,488.81	13,415.17

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HQ ID: **0008**

Project **CAO-1 / WIPP Base Operations**

Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total
TRU										
Disp. At WIPP	M3							6,435.94	0.00	176,527.84